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## ABSTRACT

The large difference in average achievement test scores between white students and black students is exacerbated in Pennsylvania by the fact that 90% of the black students are enrolled in only 9% of the state's 500 school districts. The nature of this achievement gap was examined, focusing on the variation of the gap's size as measured within a school. In 154 elementary schools that served both black and white students, the achievement gap varied from very large to no gap at all. Using statistical procedures for studying many factors simultaneously, it was found that of the 88 school and home factors studied, providing more opportunities for preschool and kindergarten experiences for black students seems to have the best chance of reducing this achievement gap. Research also indicated that home stimulation had a positive effect on student performance. These results reinforce the need for Pennsylvania to address the first of the National Education Goals, starting school ready to learn, seriously. (Contains 3 figures, 1 table, and 12 references.) (SLD)

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# Pennsylvania Educational Policy Studies

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## The Racial Achievement Gap in Pennsylvania

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The purpose of this series of papers is to contribute to a more informed debate about critical policy issues facing Pennsylvania's public schools. This PEPS series draws upon a data base that has been established here at the University of Pittsburgh under the direction of William Cooley in cooperation with the Pennsylvania Department of Education, and with funding support from the Howard Heinz Endowment and the Pew Charitable Trusts.

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## **Executive Summary**

The large difference in average achievement test scores between white students and black students continues to be a major problem. Reducing this racial achievement gap is a priority for many states and school districts. In Pennsylvania, this problem is exacerbated by the fact that 90% of the black students are enrolled in only 9% of the states 500 school districts. But that fact also helps to focus the possible solutions.

The study summarized in this PEPS report (Beckford, 1993) examined the nature of this achievement gap. In particular, it analyzed the variation that occurs in the size of the gap as measured within a school. In 154 elementary schools that served both black and white students, the achievement gap varied from extremely large to no gap at all. Using statistical procedures for studying many factors simultaneously, Beckford found that of the 88 school and home factors studied, providing more opportunities for preschool and kindergarten experiences for black students seems to have the best chance of reducing this achievement gap.

These results reinforce the need for Pennsylvania to become serious about the first of our national goals: "By the year 2000, all children will start school ready to learn." Not all black children have access to preschool programs, but those that have access, are more likely to keep up with their white peers.

# **The Racial Achievement Gap In Pennsylvania**

by

Ian A. Beckford and William W. Cooley

It has been repeatedly demonstrated that the average black student tends to score lower than the average white student on standardized achievement tests. Baratz-Snowden (1987) and Match and Mommsen (1984) provide good summaries of such studies. Reducing this racial achievement gap has become a major priority for many states and school districts. Given the pervasiveness of standardized achievement tests, and the desire to reduce this achievement gap, it is important to gain a better understanding of the nature and extent of this achievement difference. One way to obtain some insights into this problem is to identify those home and school factors that contribute to the size of this discrepancy in achievement scores between black and white students who attend the same school.

Before focusing on the within-school racial achievement gap and how it varies among schools in Pennsylvania, it is necessary to understand the context in which this problem was investigated. In the state of Pennsylvania, most school districts have few if any black students. The student population in the state as a whole is 13% black, but over 90% of the black students are in only 9% of the school districts. Figure 1 shows a map of Pennsylvania on which school

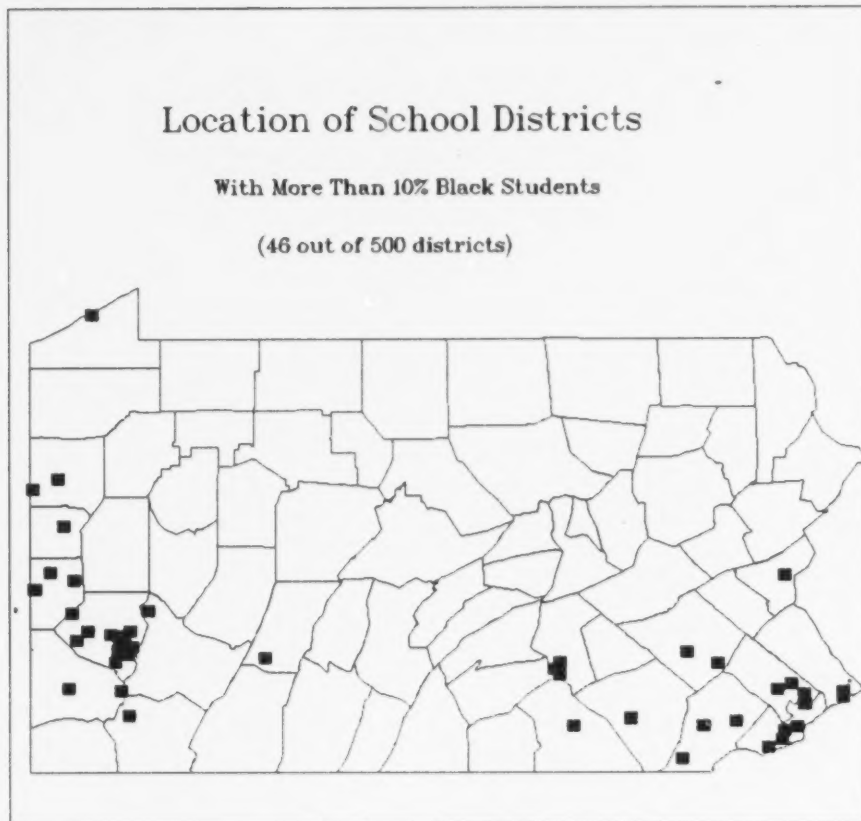


**Figure 1**

districts with 10% or more black students are located. As the map illustrates, only 46 out of the 500 operating school districts have significant numbers of black students, and those districts tend to be in either the southeastern or southwestern sections of the state, in and around our major cities.

The uneven distribution of black students is even more dramatic at the school level, as can be seen in Table 1. Out of the 1,682 elementary schools that served both third and fifth grade students in

**TABLE 1**  
**Racial Composition of PA Elementary Schools**  
**(1991)**

| Percent Black | Number of Schools |
|---------------|-------------------|
| 0             | 721               |
| .1 to 9       | 635               |
| 10 to 19      | 79                |
| 20 to 29      | 60                |
| 30 to 39      | 37                |
| 40 to 49      | 22                |
| 50 to 59      | 20                |
| 60 to 69      | 11                |
| 70 to 79      | 10                |
| 80 to 89      | 9                 |
| 90 to 99      | 48                |
| 100           | 30                |
| <b>TOTAL</b>  | <b>1682</b>       |

1991, there were 721 schools with no black students at all, and 635 schools had fewer than 10% black students. At the other end of the distribution, there were 78 schools that enrolled more than 90% black students, with 30 of those schools being totally black.

Many national researchers argue that the present educational system does not allow black students to achieve to their potential, in part because the majority of black students are enrolled in public schools that are heavily concentrated in about one-fourth of the states, and

further concentrated within those states. These black students tend to be isolated from mainstream society and that may be contributing to the lower achievement of black students (e.g. Gibbs, 1988).

### Race Differences in Achievement Grade 5 TELLS (Reading, 1991)

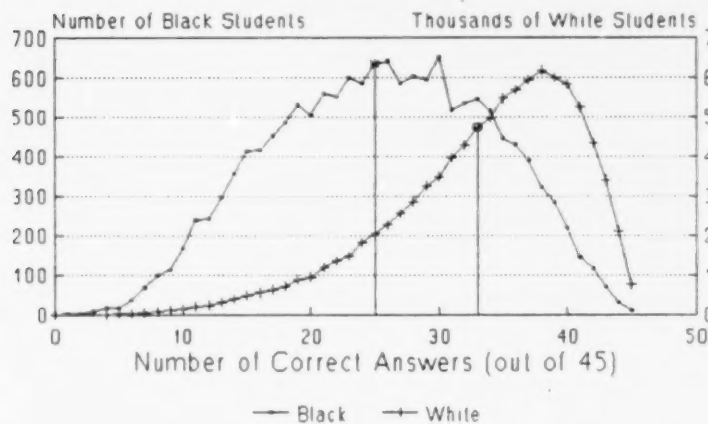


Figure 2

The size of the discrepancy in performance between black and white students can be estimated from the state wide assessment called the Test of Essential Learning and Literacy Skills (TELLS), which was given to all students in grades 3, 5 and 8 from 1985 to 1991. An example of these results is illustrated in Figure 2, which shows the black and white student frequency distributions for the spring 1991 grade 5 TELLS reading scores for the state as a whole. For example, there were 500 black students who answered 20 questions correctly on that test (using the frequency scale on the left), and 1,000 white

students with that same score of 20 (using the scale on the right). The left vertical bar (within the black distribution) in Figure 2 locates the black mean (25.28), which is eight points below the white mean (33.23, the right vertical bar). On this test, that eight point difference is about one standard deviation, which is the size of the gap. In order to obtain a measure of the race discrepancy for the Pennsylvania TELS results, we developed a descriptive statistic referred to as a "gap score." This gap score is based upon the difference between the statewide mean of the black students and the statewide mean of the white students, in relation to the amount of variation within the two groups. The higher the gap score, the greater the discrepancy between the performance of blacks and whites on TELS.

To put that reading achievement gap in perspective, 84% of the white students scored higher than did the average black student. Also, the black mean (25.28) was below the level of performance considered by the state to be the minimum competence score for that reading test, the score below which students would be expected to have difficulty in subsequent schooling. But in addition to noticing the racial group differences, it is also important to note the extensive overlap of the two distributions, i.e. there are high and low performing students in both groups.

There has been about a one standard deviation difference between

the average performances of blacks and whites on TELLS in reading and math over the past five years (Cooley, et. al., 1992). But when a gap score was computed for each school district in which at least 30 black students and 30 white students were tested in 1991, there was a tremendous amount of variation in the achievement gap among these 56 school districts. In most of these districts the black students are scoring between one-half to one full standard deviation below the white students, but what is significant is the broad range of gap scores that were found among these 56 districts, with the black students outperforming the white students on both math and reading in one of the districts.

#### **The Achievement Gap Within Schools**

The discovery of this variation in the size of the gap among districts suggested the need for a study of the factors that may explain this variation in gap. It was apparent from the research literature and from our own research experiences that potential solutions to this problem of variation in the gap statistic among these school districts were located at the school level. Therefore, it appeared desirable to examine variation in racial achievement gap among schools. In order to study possible reasons for the variation among schools on the gap statistic, it was necessary to identify those schools with sufficient numbers of both black and white students to estimate the size of the

achievement gap within each school. As was seen in Table 1, most of the 1,682 elementary schools did not have a sufficient number of black students to reliably estimate a gap score, while others had too few white students. There were 160 schools with no less than 20% black students and no more than 80% (those in the middle of the distribution in Table 1). These schools had a sufficient number of students of both races to estimate a reliable gap score within each school.

## RACIAL GAP WITHIN 154 SCHOOLS

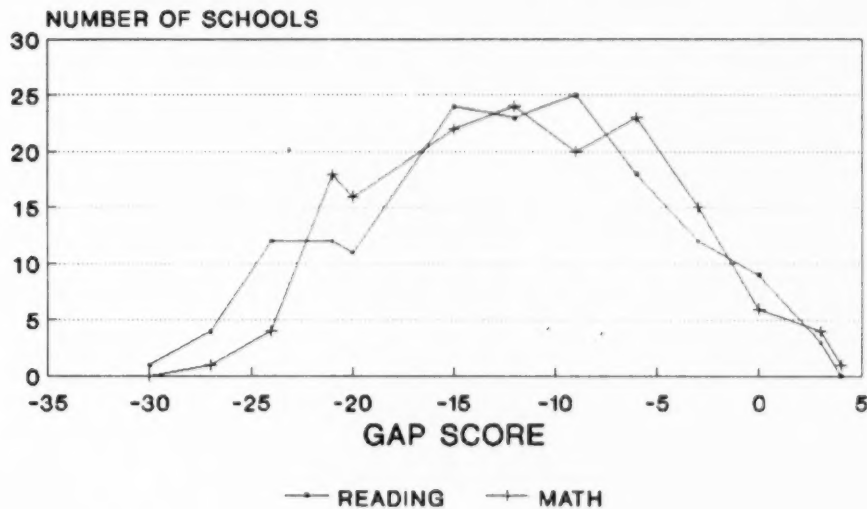


Figure 3

To obtain a measure of the within-school discrepancy on TELLS, a gap score was computed for each school that had at least 10 white and 10 black students in the fifth grade. This gap score described the amount of discrepancy between the performances of black and white

students on TELLS. Figure 3 shows the distribution of this gap score for both reading and math for 154 schools (out of the 160 potential schools) with sufficient numbers of both groups to estimate a school gap score. A gap score of -10 represents a difference of one standard deviation, which is the size of the gap for the state as a whole. About 25 schools had a gap of that size. But in some schools the gap was greater than two standard deviations (-20), while in a few other schools the black students outperformed the whites (gap score greater than 0).

Beckford (1993) conducted an in depth study of these schools in order to establish school and home factors that may be influencing the size of the gap. He began with 88 school and home variables. The school variables reflected school population demographics, preschool opportunities, teacher characteristics, and school processes. The home variables were primarily family practices that were school-related, and were derived from student descriptions of those practices. In order to identify variables that would possibly explain the variation in the gap statistic, explanatory models were developed and tested for reading and math, for both white and black students. Each of these models was tested using a technique called structural equation modeling. This type of modeling allows the investigator to statistically control for some variables while studying the potential effect of others.

An obvious initial question is whether the size of the gap is more

a function of the average level of white student performance or black student performance, since the size of the gap depends upon those two means. The analyses clearly indicate that the gap score is equally affected by black student and white student performances. That is, a small gap is just as likely to be the result of the black students performing unusually well, as it is the white students performing unusually poorly, looking across the 154 schools. Recognizing this, it was important to focus upon those factors that would enhance the performance levels of the black students.

The results indicated that schools in which black students tended to attend preschool and/or kindergarten had a higher performance level and thus a smaller achievement gap. These results are consistent with other research which has demonstrated a positive relationship between school performance and the readiness for school that can come from preschool and kindergarten attendance (Ashbury, 1978). Reynolds (1991) also demonstrated that readiness had significant direct and indirect effects on achievement. So it is not surprising that Beckford found that the black student readiness for school through preschool and kindergarten experiences is an important variable in explaining gap differences among schools.

The results of this study also indicate that the poverty status of the students attending the school significantly affects the performance

level of the students in the school. The higher the percentage of low income students in a school, the more difficult is the educational task of educating the students in that school (see Cooley, 1993, for a discussion of this point). The problem is that black students are more likely to be attending schools with heavy poverty enrollments than are white students.

Previous research (Irvine, 1990) has demonstrated that motivation for schooling that derive from home influences has a positive impact on performance. Several of Beckford's explanatory factors relate to probable home stimulation, and are consistent with the findings of other researchers. How to achieve more positive parent involvement in the education of poverty children is a major challenge, but when parent involvement exists, the positive effects are clear.

### **Policy Implications**

From a policy standpoint, there are a number of things that can be done to decrease the discrepancy in performance between black and white students. For example, these results indicate that state and federal governments should invest in developing programs to assist more minority students to start schooling at an early age. Students in these early childhood programs have increased cognitive performance during early childhood, higher high school graduation rates and higher

enrollment in post secondary programs than children who do not participate in these programs (Gibbs, 1988). Beckford's results also suggested that once the discrepancy in performance between blacks and whites is established, it is difficult to eradicate. The early years are clearly important in establishing the foundations for educational achievement (Gibbs, 1988).

The present research revealed that home stimulation had a positive impact on student performance. Again, other research has indicated that the involvement of parents in the schools would help black students. Students need to know they have their parents' support. Schools could also use parents to help them plan their childrens' educational options. Specifically, schools could encourage parents to become more involved in various activities. Parents could be encouraged to be teacher assistants or chaperons during field experiences. As was demonstrated in Clark's (1983) research, students' whose parents were directly involved in the educational process demonstrated high levels of academic performance. Regardless of which solutions are attempted, any policies which are formulated to address black student achievement must address the above mentioned activities (Jaynes & Williams, 1989).

In addition to the policy implications that flow directly from Beckford's empirical work, there are other recommendations that flow from the extensive research literature on this racial achievement gap

problem. For example, the recruitment and selection of competent, caring, confident, and creative teachers and administrators must become a priority in order to make lasting changes in the educational performance of black students. Black students need to be around confident caring professionals. In addition, more of these professionals should be black. Black students need to be around positive black role models. Interaction with these professionals also enables these students to realize that success is attainable.

Teachers, administrators and school staff should be made aware of the importance of expectations on student achievement. These professional personnel should be made aware that the expectations they have of their students will affect their students' performances. Students often respond the way they think one wants them to respond. In other words if they think that little is expected of them they will not perform well academically. In addition to raising the expectations of students, school personnel must convince students that academic performance is valued and rewarded.

One way for schools to convince students that academic performance is valued and rewarded is to involve local businesses in the education process. The school could arrange co-operative education experiences for children who perform well in school. Also, schools could convince local businesses to donate funds to allow students to

participate in various activities (e.g. computer training) that might not otherwise be available to them.

Schools must take a more active role in addressing the needs of black students. One of the major problems in solving the learning problems in urban schools has been the general misunderstanding about how schools teach children and how home and community settings work together to influence children's school behavior (Jaynes & Williams, 1989). Just as it is important to provide children with the appropriate educational opportunities, it is also necessary to ensure that parents have the necessary skills to assist their children. What are needed are integrative programs which provide children with preschool experience, provide a support mechanism to parents (educational assistance, financial advising, family counseling) and mechanisms to involve parents in all aspects of the schooling process.

It has been demonstrated that effective schools are characterized by (a) effective leadership and management, (b) good, committed teachers who know how to stimulate and challenge children to learn, (c) efficient and active classroom task structures, and (d) many parents involved in the instructional process (Jaynes & Williams, 1989). If black students are not challenged, there is little hope of decreasing the discrepant performance between blacks and whites in school achievement.

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